



HELP

ASK OUR TECHNICAL EXPERTS

CONTACTS

PLEASE EMAIL THE
RELEVANT DEPARTMENT

helpfile@computershopper.co.uk
for all PC problems

softwarehelp@computershopper.co.uk
for help with software applications

buyinghelp@computershopper.co.uk
for advice on PC purchases

YOU CAN ALSO WRITE TO US AT:

Help
Computer Shopper
30 Cleveland Street
London
W1T 4JD

HELPFILE

Security camera making PC crash

Q I have a Dell Dimension 8400 running Windows XP Home Edition Service Pack 2 running as a controller for a CCTV camera. It has 2.5GB RAM (2GB of which I recently added). There is a cable from the PC to a wireless router for my home network and internet access, a parallel cable to an HP LaserJet, a USB cable to a Photosmart printer and another to a LaCie 250GB USB hard disk. I am also running Steganos AntiVirus.

The PC is kept running most of the time to serve the network, which is a laptop and another desktop. I installed a Swann PC Guardian card and attached a camera. The LaCie external drive (X:) was dedicated as the target storage drive for the camera's images.

After a while, the desktop's colour fades and there are multiple layers of error windows I cannot view. In the middle of the screen, a message reads "X:\DVR_DATA\b7". Moving the mouse causes the screen elements to disappear or change rapidly. Sometimes the Start button appears if the mouse is pointed bottom left and the PC can be restarted. Ctrl-Alt-Del is ignored, and often the PC has to be turned off to reset it.

Other messages include "The instruction at 0x7c9eb0b4 referenced at memory 0x00650066. The memory could not be read" and "The exception unknown software exception 0x0eedfade occurred in the application at location".

Swann suggested uninstalling my Freecom USB TV tuner and reinstalling their software. This made no difference. Swann also directed me to a new beta driver, which also failed to solve the problem. The company insists its product is OK and suggests trying another computer.

I looked in the Event Log and there are no entries around the time the computer crashed, but there are a lot of errors saying, "Server 5A5AA0AA-1DEB-4683-96B0-B43301E83971 did not register with DCOM within the required timeout." When I look at the details it says: "Unable to start a DCOM Server: {5A5AA0AA-1DEB-4683-96B0-B43301E83971}. The error 'Insufficient system resources exist to complete the requested service.' happened while starting this command: C:\WINDOWS\system32\HPBPRO.EXE -Embedding."

Alan Chapman, goose-green@lineone.net

A As well as adding the camera, you've added more memory and an external hard disk. It's possible that the problem is arising from one of these components. Memory problems may show only when you run memory-intensive applications. It could also be due to a USB problem or an interaction between the drivers of various USB devices. There could be problems interacting with other PCI cards, or compatibility problems with your graphics card display drivers or with the motherboard chipset drivers.

Dell Support may have updated drivers, although sometimes you have to go direct to the support sites for graphics card and motherboard chipsets to get the latest releases.

You should start by testing the hardware. Your Dell PC should have come with diagnostics that can be

accessed by pressing F12 at boot time, or by booting from the diagnostics CD. Dell provides a quick test utility for hard disks, but this does not always show a problem. Dell support used to call this test its 90-10 test, as it claimed it would find 90 per cent of disk problems in about 10 per cent of the time it would take to run a full test. The error messages referring to X:\DVR_DATA suggest a problem accessing data on the external hard disk, but this could be due to a camera- or software-related problem.

Something that may be relevant to this problem is the DCOM Server error with HPBPRO.exe. This and a file called HPBOID.exe are two inessential services loaded by many HP printer drivers. HPBPRO is the Port Resolver Service and HPBOID is part of Status Monitor. Older versions of this software have been associated with many problems, including high processor usage, multiple copies running and memory leaks.

HP claims problems can be fixed by updating to the latest version of the drivers or by re-registering the files, but many users say they have had to stop these services from running before the problems ceased. For newer drivers, visit www.hp.com. To re-register these files, HP suggests you open a command prompt window by clicking Start, Run and typing cmd.exe in the Run window. Click OK. Next, in that command window, change to the System32 folder and re-register by typing the following commands:

```
cd \windows\system32
hpbpro.exe -RegServer
hpbpro.exe -Service
```

Then restart your PC. If this has not solved the problems, click on Start, Run and type in msconfig, then click OK to bring up the System Configuration Utility. Look for two entries like these:

1. StatusClient "C:\Program Files\Hewlett-Packard\Toolbox\Apache Tomcat 4.0\webapps\Toolbox\Sttusclient.exe /auto"
2. hpbpsttp "C:\Program Files\Hewlett-Packard\Toolbox\hpbpsttp.exe"

If you stop these services running, you may find your problems disappear.

The Swann drivers seem to have a history of causing lock-ups. Some user reviews on Amazon mention a feature in older versions of the software that automatically reboots the computer every hour to avoid this. Make sure you are using the latest drivers and recording software. Most users don't experience lock-ups any more, so there must be something in your system that triggers the problem. Our reviewer did not find any such problem, although we weren't too impressed by the quality of software.

It is preferable to allocate a separate computer for use as a security video server. That way, you can minimise conflicts with other software or hardware. Even an old computer (provided it is running Windows 2000 or later) would do. Large hard disks can be added cheaply, although we would avoid external USB drives for this application.



Struggling with standby problem

Q I have recently built two PCs, both with Windows XP Professional Edition. On one of them I can go into Standby mode, but the other just reboots when I try. When I click on Start, Shutdown I get different windows in each of the computers. On the one that works, I get a drop-down menu where I can select Standby. On the other, I get a window with three icons when I click on Start, Shutdown. One of these says Standby, but when I click on that the computer reboots.

Bill Fry, scamander@tiscali.co.uk

A Standby and Resume problems are common, although less so than they used to be. They are usually caused by driver or firmware issues or by incompatible hardware. The most important step you can take to eliminate them is to update the drivers. The difference in menus is not related to this problem.

If your system restarts when you select Standby, it sounds like it is experiencing a blue-screen error and you have the 'Automatically restart after error' option selected, causing it to restart before you can see the error. To fix this, right-click on My Computer, choose Properties then click the Advanced tab and click on the Startup and Recovery Settings button. Make sure the option to restart automatically is not selected. You

should be able to see the error details after selecting Standby. Hopefully these will include the name of the module causing the problem.

While you have My Computer Properties open, you should click on the Hardware tab and then click the button for Device Manager. Click on the '+' sign next to Computer and you should see an entry for Advanced Configuration and Power Interface (ACPI). If you don't, or you see Automatic Power Management (APM), you probably haven't loaded the correct drivers for your motherboard chipset. Go to the motherboard or the chipset manufacturer's website to download newer drivers, which should include the ACPI driver.

Another way to see what is wrong is to open the Event Log. Click on Start, Run and type in Eventvwr.msc then click OK. Look under System. Going into standby and resuming does not normally generate any messages, except a warning from TCP/IP that the network adaptor has disconnected and reconnected.

If the event log or stop message does not give you any clues as to what is wrong, you should try removing all the non-essential components. Make sure you have the latest drivers for your graphics card, as they are a common cause of standby errors. Hopefully, removing the incompatible device will cure the issue and you can then investigate to see if that device has an updated driver.

What's in my index.dat files?

Q I recently read Ken Jones' letter in *Letters, Shopper* 230. As a new reader of *Shopper*, I appear to have missed the articles he mentioned, which were in *Shopper* 228's *Ultimate How To...* and *Advanced Windows, Shopper* 223. Although I know how to clear Internet Explorer's browser history and delete cookies, I am unaware of how to view and remove index.dat files. I can find index.dat files, but have no clue how to open them and view their contents. Is there a program I need to download, or can I do it using Windows tools?

Tom Green, blahblah23@hotmail.co.uk

A Index.dat files are indexes that are created and used by Internet Explorer to keep track of cookies, history and temporary internet files, which are cached webpages. They contain a great deal of information about a user's web history. Old or duplicate copies are often left behind, even after a user clears their history and temporary files.

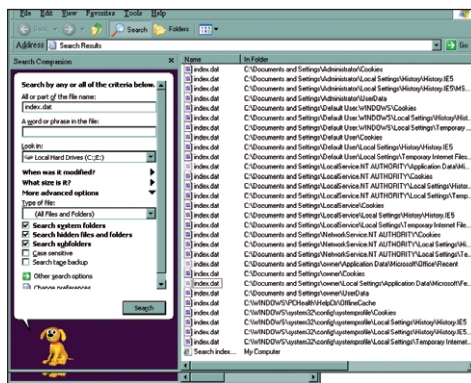
To find them, you can use Windows Search. Click Start, Search. Since many of these files are hidden or contained within hidden or system folders, you must click 'More advanced options' and choose to search in System Folders, Hidden Files and Folders, as well as all subfolders. To see the results, go to Tools, Folder Options, click the View tab and select Show Hidden Files and Folders. These are not all created by Internet Explorer. Other programs use files called index.dat, so you won't want to delete all the files you find.

Microsoft did not intend for index.dat files to be read. A free program called IndexDat Spy from www.stevengould.org will search for index.dat files created by Internet Explorer and show you what information these files contain. The same author has a program called CleanUp!, which is free, but asks for a donation. This removes temporary files, including these index.dat files. The information in index.dat files can be read

even after the files have been deleted, so choose the secure delete option to prevent this. Other programs will also delete this information securely.

Windows frequently makes temporary copies of the information in these index files. This information is often left on the disk even after the files have been deleted. A normal file deletion removes only the pointer telling Windows where to find the file. For speed, the contents of the file remain on the disk until the disk sector is reused. A data forensics expert can find traces of sites visited, even after files have been deleted. In fact, this is one of the first things we look for when asked to investigate a computer.

To avoid this, you need to use a utility to wipe both free and slack disk space securely. A free program called Eraser (www.heidi.ie/eraser) will do this. In our opinion, the multi-pass secure delete is overkill. Unless your drive contains data that the security services of a superpower would like to see, wiping it once with any data (even zeros) is sufficient and much faster.



▲ Use 'More advanced options' in Windows Search to find index.dat files in all system folders and subfolders

Your experts

HELPFILE

154

Paul Mullen

With 27 years of PC experience as a power user, programmer and IT consultant, Paul Mullen answers all PC problems, tackling hardware, system and security issues.



helpfile@computershopper.co.uk

SOFTWARE HELP 160

Kay Ewbank

Database developer and productivity expert Kay Ewbank offers help with office applications.



Ben Pitt

Professional musician and keen photographer Ben Pitt gives advice on using creative software.



softwarehelp@computershopper.co.uk

BUYING HELP

164

Chris Finnamore

Labs Manager Chris Finnamore recommends the best products for your requirements.



buyinghelp@computershopper.co.uk

CONTACTS

Please contact the relevant department at the email address listed above. You can also write to us at:

**Help
Computer Shopper
30 Cleveland Street
London
W1T 4JD**

Please try to give full details of your problem. We need an email address or daytime and evening telephone numbers in case we need more information.

Although the policy of *Computer Shopper* is not to publish readers' email addresses, we include them in Help so that other readers with experience of similar problems can share their solution (please also cc any comments to the relevant Help department above). If you would prefer not to have your email address published, please say so.

Can I build my own super computer?

Q I build a new PC every couple of years and have accumulated six, not including my current PC. The most basic is an AMD Athlon 650 with 512MB of PC133 RAM. I do mass number-crunching for a degree. Even with my current PC, an AMD Athlon 64 X2 6000+ with 2GB of RAM, it can take days and makes the PC almost unusable due to the resources it takes up.

I've heard it's possible to utilise the processing power of multiple PCs over a network in such a way that they act as a single powerful PC working on the same task. If so, how? All my PCs run Windows XP Home Edition and are LAN-capable.

Rebecca Aggett, *saveme1988@hotmail.co.uk*

A This concept is known as distributed computing. Projects such as SETI@Home (<http://setiathome.berkeley.edu>) do this, but we don't know of any software that makes it easy to implement. You would have to write your own programs. You need a master program that breaks the computation up into separate parts and sends each sub-problem to a process running on a networked computer. When finished, each networked computer would return the results to the master program.

There are several ways the programs could talk to each other. The simplest would be for all the programs to access a shared data file. The master program would store a list of tasks to be done and each slave program, when free, would

take the next available task, marking it as being in progress and attributing it with a unique ID. When finished, it would save its results to a file in the shared folder and then mark the task as completed.

For larger projects, you might want to look at BOINC (<http://boinc.berkeley.edu/dg.php>), which is the system behind SETI@Home. A preconfigured BOINC server can be downloaded from <http://desktopgrid.hu>, but you'd still need to develop your own collaborative applications, and this will be complicated. It might suit a large scientific company or university, but for just a few computers you might as well develop programs that simply share access to files in a shared folder.

Feedback How do I stop this spam

I am replying to Mike Trollen's letter about spam on Freeserve, which you published in *Helpfile*, *Shopper* 240. First, Freeserve marks what it thinks is spam with ***SPAM*** in the subject. I use that to filter with MailWasher.

If that option is no longer available, he could set up a filter within Freeserve/Orange. This could move any mail not sent to him to

his deleted items folder, which I believe gets cleared in seven days. Alternatively, MailWasher is free for one mail account.

Paul Steel, *psteel@psteel.freeserve.co.uk*

A Thanks for your comments. We think that we have found an even better option. Google has just added a feature to Google Mail called Mail Fetcher,

which allows you to collect mail from any POP3-based email account into your Google Mail inbox.

This will then use Google's excellent spam filtering on your incoming email. You can then download the filtered email (minus all the spam) to Outlook Express, or any other POP3 email client that you prefer. See below for more details.

USING GOOGLE MAIL TO STOP SPAM

In *Helpfile*, *Shopper* 240, when we discussed Mike Trollen's problems with spam, we rated Google Mail's free spam filtering as being almost as good as subscription services such as Cloudmark Desktop. Just after we went to press, Google announced a new feature of Google Mail that lets you use its free spam filtering while keeping your present email address.

The new feature is called Mail Fetcher and it will allow you to collect mail from up to five POP3 email accounts and store the messages in your Google Mail mailbox. Since Google Mail also offers free access to mail using POP3, you can then download the mail (minus the spam) using your regular email client, or access it in Google Mail's web-based interface.

You can even set Google Mail to use your present email address as the From address on all emails you send from Google Mail. If you do this, bear in mind that some spam filters may then consider the email headers as forged and classify such emails as suspiciously spam-like.

Open a free Google Mail account at <http://mail.google.com>. This gives you access to other Google Office Applications, such as a word processor and spreadsheet. Once you've logged in and created a permanent password, make a note of the server settings for your existing email account.

The account must support POP3 access. Yahoo! usually charges extra, and it is not available for Hotmail. If you use an email client such as Outlook, Thunderbird or Eudora, you probably have POP3 access.

ADD A POP3 ACCOUNT

In Outlook Express you will see the POP3 settings under Tools, Accounts, Mail, Properties.

Look on the Servers tab to get the name of the incoming mail server. Make sure this is POP3. Check the login name, which is sometimes your full email address and sometimes just the part before the @ sign. You'll also need the login password, which Outlook Express hides. If you don't remember it, use the free utility at <http://nirsoft.net/> to reveal hidden email passwords. You should also check the Advanced tab for any special settings. POP3 normally uses port 110 but some servers may require a different port, or may use secure (SSL) connections.

To set up Mail Fetcher, click Settings from the top of any Google Mail page, then click Accounts. In the 'Get mail from other accounts' section, click Add another mail account. Enter the full email address of the account that you'd like to access, then click Next Step. Check the username and POP3 server addresses that Google Mail guesses as yours may be different. Enter your password. You can usually ignore the rest of the options, unless your ISP requires SSL access, then click Add Account.

Once your account has been added successfully, you'll have the option of setting a custom From address. This allows you to compose messages in Google Mail but have them appear to be sent from your other email account.

Once you have set up Google Mail to receive mail from your POP3 account, you can choose either to read it in Google Mail's web-based interface or download it to your regular email client. You have to be online to read mail using a web interface so, if you are using a pay-as-you-go dial-up connection, you will probably want to download it to your email client so you can read it offline.

To do this, you'll need to click on Settings from any Google Mail page, choose Forwarding and POP/IMAP, then check the Enable POP option. We suggest that you set Google Mail to archive mail that has been downloaded rather than delete it. That way, you can still access your email while you're away from the computer and you can use the useful search functions to find a particular email.

CLIENT SETTINGS

Click on the link to get instructions on how to set up your email client. Google Mail requires you to use SSL, so you will need to follow these instructions exactly. Replace the settings for your existing email server with the Google Mail settings and you should receive all your mail, minus the spam.

Mail classified as Spam will remain in Google Mail's Spam folder. At first you should check this to make sure that Google Mail is not mistakenly adding any mail you want. This is most likely with bulk email from mailing lists, particularly if it contains advertising material. Move any misclassified mail to the inbox. Adding the sender's address to the address book should prevent this happening in future.

Once you have trained Google Mail to recognise the bulk mailing lists to which you subscribe, you should get few genuine emails misclassified as spam. You're still likely to get a few spam emails in your inbox, but you can improve Google Mail's filtering by clicking on All Mail and then marking these emails as Spam. For the first few months, you should regularly use this feature to train the spam filters. After that, it should eliminate about 99 per cent of spam by itself.

Recovering data after RAID conflict

Q Since 1999, when I got my first CD writer, I've been copying my vinyl to the computer and removing the clicks and pops by hand using the Sound Forge audio editor. I don't use any noise-reduction software as it takes too much of the music away. In the past, I've spent hours on one three-minute track, cleaning it up.

In addition to the drives that came with my computer, I've added a Syba SATA 3114 PCI four-channel controller that has two 250GB Maxtor DiamondMax 10 hard disks set up as a RAID 1 mirror and partitioned as a single volume (H:) for my music, which I store as Wav files.

However, I'm afraid to say disk mirroring is not safe. Windows locked up, complaining about not being able to write a file to my H: drive. I reset the computer, and the Silicon Image 3114 controller came up with this:

```
"SET 0 invalid raid drive
0 PM Maxtor 6V250F0 239372 MB
1 SM Maxtor 6V250F0 239372 MB"
```

I've tried buying a new Silicon Image controller to see if that would detect the drives correctly, but it was still the same. In desperation I left one of the drives connected to the controller and chose the option to delete the RAID set in the hope that I would be able to see the data, but it was gone.

Is there a way to recover the data off my remaining hard disk? I've already formatted the other drive, which works fine.

Lloyd Rainford, lrainford@boltblue.com

A We don't like RAID 1 mirroring, as far too many problems can arise with it. It is usually much better to set up two separate drives and use some file

backup software to copy data to the second drive. RAID can be useful on servers, where only 20 per cent of the space in a five-drive array is needed to hold parity data, enabling the array to be rebuilt if one drive fails. Even then, a separate backup is needed in case of multiple drive failure, or to protect against data loss from viruses, or malicious or careless employees.

Most RAID 1 controllers arrange the data on the drive in such a way that all the data will be available if you put either drive from a mirror array into a non-RAID computer. On those drives the RAID setup information is stored in a sector that would normally be empty, while the Master Boot Record (which points to the start of the first data partition) is at sector 0. A non-RAID controller (or a RAID controller with RAID turned off) should then be able to read either drive from the mirrored set.

EXPERT HELP

If the drive is still not accessible, you'll need to get into the innards of disk partition structures. This is advised only for advanced users, and perhaps a local computer repair shop may be able to help, although not all understand drive structures. A better bet may be to contact a data recovery expert. We suspect this would be a relatively easy job for an expert, but check the costs carefully as many companies have high minimum charges and are reluctant even to discuss possible costs until they have your drive in their hands.

There could be two reasons why these drives are not accessible. The first, and most likely, is that there was a power glitch or something similar while writing to the drive, which caused it to write some file data to sector 0 erroneously, overwriting data at the start of the drive. This is a common cause of disk corruption. Sector 0 contains the Master Boot Record, and RAID data

is stored just after it. Unfortunately, with mirrored RAID, both drives will be damaged in exactly the same way, illustrating why a separate backup drive is better than a RAID mirror.

The second possibility could be that your RAID controller uses the first few sectors on each drive to store RAID configuration data, and all the data will be offset by that number of sectors. RAID usually reserves 16, 32, 64 or 128 sectors for data, so the Master Boot Sector (which is normally stored at sector 0) may be found at sector 16, 32, 64 or 128.

RECOVERY PROGRAMS

A few partition recovery utilities can rebuild a damaged or missing Master Boot Record. However, these utilities could easily get confused if the RAID controller has introduced an offset in the data, and could then make matters much worse in their efforts to repair it. Therefore, we suggest that you first use a disk editor program to view the raw sectors on the drive and then figure out what is missing and whether data is offset. We use WinHex (www.winhex.com) for this. The free trial version should be sufficient to see what is going on.

You are looking for a boot sector, and you should see the characters NTFS a few bytes in from the start of the sector – probably at sector 63, but possibly offset. In this case, they could be at 16, 32, 64 or 128 sectors further down. In case the first boot sector has been overwritten, there is a copy at the end of the partition.

If the boot sector is at sector 63, it should be a simple matter to copy the Master Boot Record from a working drive to sector 0 of this drive and then edit the values. An offset can be repaired by creating a new master partition record with the correct starting sector. This will give access to data, although such a repaired drive may not be bootable.

Desperately seeking Spybot

Q You have recommended installing Spybot, but when I go to the internet there appear to be lots of different Spybot programs. Please can you tell me what address to type to get the authentic Spybot?

George Katritzky, g.katritzky@talktalk.net

A Lots of bad guys have taken advantage of the popularity of Spybot Search & Destroy to mislead customers. Google has removed a few of the worst of these, while the legitimate authors have been taking legal action against some offenders, but more sites keep springing up.

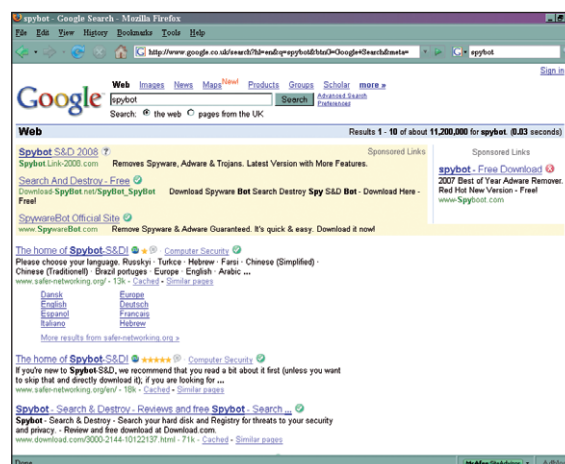
When we Googled Spybot, we found four paid advertising links listed above the official site. The first offers to download Spybot Search & Destroy but admits that it is not run by the author and is not affiliated with the author. In fact, the site tries to get you to download an unspecified anti-virus program, a Registry cleaner and a backup program we have never heard of. Only then does it redirect

you to a genuine download link for Spybot Search & Destroy.

The second and third advertising links, Download-SpyBot.net and SpywareBot.com, try to persuade you to download an unrelated program called SpywareBot, a renamed version of a program called Adware Alert. This is not on our recommended list of security utilities. The fourth advertising link is for www.Spyboot.com (note the hyphen after www and the spelling of 'boot'). This site tries to tell you Spybot Search & Destroy is not very good and that you should download its Spyware Doctor program, which is not free. This site has a Danger rating from McAfee's SiteAdvisor due to user complaints about the merchant.

The official site is www.safer-networking.org/en. You can also

download it from Download.com, Majorgeeks.com, Snapfiles.com or Tucows.com, and it is also in the Expert Toolkit section of our cover DVD.



▲ The popularity of Spybot Search & Destroy has spawned many imitators, as you'll find out if you Google 'Spybot'

Unhappy about published email addresses

Q I have had a couple of emails from people I do not know. They were asking me about a tweak on my router that I had mentioned in an email you published in *Shopper*. I went back and checked and, lo and behold, I saw that my email address had been published in the magazine.

I checked other issues of *Shopper* and I found that everybody had their email addresses published in the main section of *Helpfile*. Other sections of *Help* did not and some just stated that the letter was "via email".

As far as I am concerned, publishing people's email addresses is disingenuous. It is bad enough trying to avoid spam and emails from strangers without *Shopper* positively encouraging it. This to me is a privacy concern.

Please can you state your reason for doing so. Or is this a genuine mistake on your part?

(Please do not publish my email if you end up printing this letter!)

Darrin Maunders, via email

A This is a deliberate policy, as is stated in the instructions for submitting your question to *Helpfile* at the bottom of the second page of *Helpfile* each month. We publish email addresses in *Helpfile* unless the reader asks us not to, as we have found that publishing them is useful to readers. By publishing email addresses, other readers who have had the same problem can contact you and relate their experiences and solutions.

Your letter was slightly unusual in that it hinted at a tip that other readers might find useful. The fact that you received emails from people who had read your letter and our answer shows that the policy is working as intended.

The advice in other parts of the *Help* section tends to be less suitable for a community effort. *Helpfile* often deals with very specific problems

that are likely to affect only a few readers, and so we encourage those who have had experience of that particular problem to get in touch with each other.

Spam should not be a concern. Spammers want to harvest hundreds of thousands of email addresses at a time, and to do this they automate the process. For example, they will steal every email address found on a virus-infected computer. So if anyone you have sent email to or received email from is infected by a virus, your email address will likely be sold and added to the spammers' address lists.

To harvest emails from the printed pages of *Shopper* requires that a person reads them and then types them into a list. This is not very cost-effective when address lists sell for a fraction of a penny per address.

We can reassure you that we do not publish email addresses on the web, and furthermore we do not publish email addresses if the reader specifically asks us not to.

Why is Serial ATA faster than Parallel ATA?

Q I have worked as a maintenance electrician/engineer for many years, and was taught a long time ago that parallel connections were faster than serial connections, as it was better to shift eight bits at a time rather than one bit over short distances. Now we have serial hard drives superseding parallel drives. Could you explain why this is?

Rick Masson, via email

A You are quite right that parallel connections, which send eight bits at a time, are inherently faster than serial, which sends one bit at a time. However, serial interfaces are a lot cheaper to build. Just as USB, which uses a serial protocol, has replaced parallel printer interfaces and PCI-E is replacing PCI due to cost, Serial ATA (SATA) is replacing Parallel ATA (PATA). This is not because SATA is faster – early SATA drives were actually slower than the drives they replaced. However, SATA is cheaper to build.

The IDE drive interface standards have been in use since 1986, and started with a speed of about 3.3MB/s. It has had several modifications to increase speed. The most significant of these was the change from a 40-conductor cable to 80 conductors, allowing speeds to increase from 33MB/s to 66MB/s. This was necessary because, as speed increased, so did the amount of interference between the parallel wires. The additional 40 wires are all grounds, intended to reduce interference at higher speeds.

The transfer speed increased to 66MB/s and then to 100MB/s, eventually reaching 133MB/s. After that, engineers claim that interference between adjacent wires, and also slight timing differences between different wires of the same cable, present obstacles that made a complete redesign necessary.

There was no great need to increase the speed of the hard disk interface, as the

mechanical limits of current hard disk technology are the real limit on drive speed. However, SATA allows the future development of technologies such as hybrid flash and mechanical drives that may take advantage of the higher speeds.

Serial ATA uses a number of more advanced signal-processing techniques to increase speed, but then most of these could also have been implemented in a parallel form to give potentially even higher speeds. The reason they weren't is cost. The designers found ways to make SATA fast enough while reducing the number of components and the size and cost of cables and connectors.

PARALLEL LINES

SATA was originally designed by Intel. From a chip designer's viewpoint, the trouble with PATA was that I/O controllers, due to the voltage they need to operate over a distance of up to 45cm, cannot be shrunk in size like other components of computer chips. Size reductions mainly come from placing components closer together, which requires less insulating material between traces, and so needs lower voltages. Since parallel connections need eight I/O drivers instead of just one, they were taking up a disproportionate amount of space on the I/O chip.

Motherboard designers also hated parallel connectors. Interference meant that the data lines could not be placed next to each other and had to be spaced apart, yet the connections all had to be exactly the same length to avoid timing problems. At the same time, advances in chip technology made it easier and cheaper to introduce advanced signal-processing techniques to increase the speed possible on serial (or parallel) interfaces.

The big reason for the switch is that SATA connectors are a lot cheaper to make and are physically smaller. This is particularly important with laptop computers. Intel engineers took

advantage of the opportunity to introduce a new interface that would be cheaper and take up less space.

SATA has only one drive per cable, reducing reflected signals found using the extra connector on a parallel cable. It has a separate return signal pair, allowing data and acknowledgements to overlap. PATA uses the same wires for both. SATA has no cross-talk problems between parallel wires and no problems from the small differences in signal timing, which allow it to increase the bit rate.

Instead of the power-consuming 5V signal used by PATA, SATA uses low voltage differential (LVD) signalling. This is the same as in recent versions of SCSI, where each wire carries a signal of +/-0.25V, while the other wire in the pair balances it with a signal at the opposite voltage, so there is always a 0.5V difference between them. Apart from saving power and making the I/O chips smaller, this also helps eliminate noise.

CODE SAFETY

More importantly, SATA encodes the data. Every eight bits of data are transmitted as 10 bits, encoded in such a way that there are always a roughly even number of ones and zeros. There are never more than four ones together. Having too many ones together introduces a DC component into the signal that is trickier to handle, and prevents PATA connecting to external drives.

This 8b/10b encoding was first invented by IBM back in 1983 and has been used extensively in digital audio, PCI-E, FireWire and high-speed networking. The encoding used also incorporates a built-in clock signal, which makes it easier for the two ends to keep in sync at faster speeds.

Of course, they could have incorporated most of these changes into a new parallel interface to get even greater speeds, but when SATA can offer fast speeds of 150MB/s and 300MB/s, why should they bother?

Resizing image to digital photo frame

Q I recently bought a 7in digital photo frame to display my holiday photos. I have come across a problem that I hope you can help me solve. Whenever I transfer photos from either of my digital cameras (a 4.1-megapixel HP R507 and a 7.1-megapixel Canon IXUS 850IS), and display them on the screen I get a thick black band down either side. I assume this is because the aspect ratio of the digital photo frame (480x234 pixels) is different to that of the camera.

Is there any software, preferably freeware, that can resize the digital photos to the aspect ratio of the frame? Ideally, it would overlay a box of the correct aspect ratio over the original and allow me to drag it around. That way, I can choose which parts of the image to use and which to discard.

Alan Green, d.a.green@dsl.pipex.com

A TV screens and computer monitors traditionally use a 4:3 aspect ratio, so common resolutions are 640x480, 800x600 and 1,024x768. Resolutions of 1,280x1,024 and 1,600x1,200 slightly distort this aspect ratio.

However, 35mm film cameras have always used an aspect ratio of 3:2. As a result, most consumer digital cameras tend to use a 4:3 aspect ratio to match standard screen resolutions, while more expensive professional digital cameras use a traditional 3:2 ratio.

Traditionally, printed photos have also used a 3:2 aspect ratio. For example, 6x4in (15x10cm) is a popular standard print size. There are a few consumer cameras available that offer a choice of aspect ratios, but they usually just achieve this by cropping the edges of the picture, reducing a 6x4½in image to fit a

6x4in print size. When you get digital pictures printed, you will often find the edges cropped like this, although some internet-based companies have started to offer print sizes such as 6x4½in to match the aspect ratio of common digital cameras.

Digital photo frames are based on standard LCD panels so they tend to be mainly 4:3 aspect ratio, using 640x480, 800x600 or 1,024x768 resolutions. Some may be widescreen, using a 16:9 aspect ratio. A few products try to match the 35mm film 3:2 aspect ratio with screen sizes such as 720x480. Then there are cheaper 7in digital photo frames that claim a 16:9 aspect ratio but have 480x234 pixels. If their aspect ratio claim is correct, this means that their pixels are not square (or else they would have 480x270 pixels). Whatever their real aspect ratio, it does not match that of any camera.

TOP OF THE CROPS

As you have figured out, the solution is to crop your digital photos to fit the frame's aspect ratio. Usually cropping improves the picture as well, allowing you to frame the subject nicely and to zoom in on the relevant area.

Many cameras, and most colour printers, come with free photo-editing software. These vary in quality considerably, from near-useless to very powerful. Most offer the facility to crop the picture. Look for a rectangle selection tool that allows you to select the part of the picture you want to keep. If you don't have any of these, MS Paint is a useful tool. It is found in Programs, Accessories and lets you select a rectangular area, showing you the size of the selection in pixels on the status bar. Although there is no crop command, you can achieve a cropped image by copying the selection to a new image.

► Even a basic photo-editing program such as MS Paint will allow you to crop an image to fit your digital frame



Confused by missing module messages

Q My son's PC is getting two error messages, which appear when he starts up Windows XP. They are:

"Error loading C:\Windows\System32\mqqrwtx.dll The specified module could not be found"

"Error loading C:\Windows\System32\gimqcjex.dll The specified module could not be found"

At the same time, "Rundll" shows at the bottom of the screen. I would be grateful if you could suggest a way of getting rid of these. Can they be edited out in Registry or System Configuration?

Brian Glover, briangloverx@tiscali.co.uk

A It's a good job you are getting error messages about these missing files. Both these names appear to be randomly generated names, indicating a virus or spyware infection. We suspect that if you look in the log of your anti-virus software, it will have detected these as infected files and

removed them, without removing the system entries that try to load them.

In most cases, the simplest way to get rid of the errors is to click on Start, Run, then type in msconfig and click OK. This loads the System Configuration Editor. Click on the Startup tab, increase the width of the Command column so you can see more of each line and look for the lines that try to load these files. The description preceding each entry is likely to be fake. You can then untick the lines to prevent them from loading.

Some startup entries are not shown in Msconfig, or may have been deleted by the spyware infection to make detection and removal more difficult. In that case, we suggest you download HijackThis!, available from www.trendsecure.com. This lists a lot of system startup entries and allows you to select those you want to fix. It needs to be used with caution, though, as it does not tell you which entries are good and which are bad. Look for the two filenames and just remove the entries that use them. HijackThis! also allows you to save a log file, which you can send for expert analysis.

Searching the Registry may work in most cases, but it is not as effective as using HijackThis! and should be done only by advanced users who know what they are doing and who can recover from mistakes.

Our main concern is that if something removed the files but did not delete the entries that load them, there may still be other parts of the infection left on your system. This is a typical situation where you have an anti-virus program that contains definitions for just some of the Trojans on the system. Spyware that generates random names such as this often also generates random differences in its modules, changing the signature that anti-virus programs search for.

To catch this, anti-spyware programs are usually far more sophisticated in their detection methods. If you don't already have an anti-spyware program, in addition to an anti-virus program, it would be a good idea to get one. In fact, get two or three and scan with all of them, as one may pick up something the others have missed. However, only one should be set to provide real-time protection, to avoid slowing down your computer. **CS**